SUPPLEMENTAL MATERIAL

Appendix 1. PRISMA 2009 check-list

Section/topic	Item No	Checklist item	Reported on page No
Title			
Title	1	Identify the report as a systematic review, meta-analysis, or both	1
Abstract			
Structured summary	2	Provide a structured summary including, as applicable, background, objectives, data sources, study eligibility criteria, participants, interventions, study appraisal and synthesis methods, results, limitations, conclusions and implications of key findings, systematic review registration number	2
Introduction			
Rationale	3	Describe the rationale for the review in the context of what is already known	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS)	4
Methods			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (such as web address), and, if available, provide registration information including registration number	4
Eligibility criteria	6	Specify study characteristics (such as PICOS, length of follow-up) and report characteristics (such as years considered, language, publication status) used as criteria for eligibility, giving rationale	4
Information sources	7	Describe all information sources (such as databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated	eFigure1
Study selection	9	State the process for selecting studies (that is, screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis)	4-5
Data collection process	10	Describe method of data extraction from reports (such as piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators	4-6
Data items	11	List and define all variables for which data were sought (such as PICOS, funding sources) and any assumptions and simplifications made	5-6
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis	6-7
Summary measures	13	State the principal summary measures (such as risk ratio, difference in means).	6-7
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (such as I^2 statistic) for each meta-analysis	6-7
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (such as publication bias, selective reporting within studies)	6-7

Section/topic	Item No	Checklist item	Reported on page No
Additional analyses	16	Describe methods of additional analyses (such as sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified	6-7
Results			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram	7-8 and eFigure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (such as study size, PICOS, follow-up period) and provide the citations	7-8, Table 4
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see item 12).	8-9, Table 4
Results of individual studies	20	For all outcomes considered (benefits or harms), present for each study (a) simple summary data for each intervention group and (b) effect estimates and confidence intervals, ideally with a forest plot	8-9
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency	8-9
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see item 15)	8-9
Additional analysis	23	Give results of additional analyses, if done (such as sensitivity or subgroup analyses, meta-regression) (see item 16)	8-9
Discussion			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (such as health care providers, users, and policy makers)	10-12
Limitations	25	Discuss limitations at study and outcome level (such as risk of bias), and at review level (such as incomplete retrieval of identified research, reporting bias)	11-12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research	13
Funding			
Funding	27	Describe sources of funding for the systematic review and other support (such as supply of data) and role of funders for the systematic review	None

Appendix 2. MOOSE checklist

Criteria		Brief description of how the criteria were handled in the review
Reporting of background		
☑	Problem definition	The relationship between resting heart rate and heart failure risk has not been reliably quantified. We report new findings from three population-based studies, and a meta-analysis
☑	Hypothesis statement	Elevated resting heart rate is associated with increased risk of heart failure
☑	Description of study outcomes	Incident heart failure
☑	Type of exposure	Resting heart rate
☑	Type of study designs used	Prospective (cohort, case-cohort or “nested case control”) population-based studies
☑	Study population	Individuals without pre-existing overt heart disease
Reporting of search strategy should include		
☑	Qualifications of searchers	Hassan Khan, MD,PhD; Setor Kunutsor, MD
☑	Search strategy, including time period included in the synthesis and keywords	Time period: from inception of MEDLINE, EMBASE, Web of Science February 2014. **Search strategy:** 1 (Heart rate”[MeSH] OR "heart rate"[All Fields]) 2 ("Heart Failure"[MeSH] OR “Heart Failure”[Majr] OR "heart failure"[All Fields]) 3 ("humans"[MeSH Terms]) 4 (1 AND 2 AND 3)
☑	Databases and registries searched	MEDLINE, EMBASE, and Web of Science
☑	Search software used, name and version, including special features	Ovid was used to search EMBASE Reference Manager used to manage references
☑	Use of hand searching	We searched bibliographies of retrieved papers
☑	List of citations located and those excluded, including justifications	Details of the literature search process are outlined in the flow chart. The citation list for excluded studies is available upon request.
☑	Method of addressing articles published in languages other than English	We placed no restrictions on language
☑	Method of handling abstracts and unpublished studies	None found
☑	Description of any contact with authors	Not applicable
Reporting of methods should include		
☑	Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	Detailed inclusion and exclusion criteria are described in the Methods section.
☑	Rationale for the selection and coding of data	Data extracted from each of the studies were relevant to the population characteristics, study design, exposure, outcome, and possible effect modifiers of the association.
☑	Assessment of confounding	We assessed confounding by ranking individual studies on the basis of different adjustment levels, and performed sub-group analyses to evaluate differences in the overall estimates according to levels of adjustment.

☑	Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	Study quality was assessed based on the nine-star Newcastle–Ottawa Scale using pre-defined criteria namely: population representativeness, comparability (adjustment of confounders), ascertainment of outcome. Sensitivity analyses by several quality indicators such as study size, duration of follow-up, and adjustment factors.
☑	Assessment of heterogeneity	Heterogeneity of the studies was explored with I^2 statistic that provides the relative amount of variance of the summary effect due to the between-study heterogeneity.
☑	Description of statistical methods in sufficient detail to be replicated	Description of methods of meta-analyses, sensitivity analyses, meta-regression and assessment of publication bias are detailed in the methods. We performed random effects meta-analysis with Stata 12.
☑	Provision of appropriate tables and graphics	Table 1, Figures 1-4, Supplemental Tables
Reporting of results should include		
☑	Graph summarizing individual study estimates and overall estimate	Figure 4
☑	Table giving descriptive information for each study included	Table(s) 1&4
☑	Results of sensitivity testing	Sensitivity analysis was conducted to assess the influence of each individual study by omitting one study at a time and calculating a pooled estimate for the remainder of the studies. Results section
☑	Indication of statistical uncertainty of findings	95% confidence intervals were presented with all summary estimates, I^2 values and results of sensitivity analyses
Reporting of discussion should include		
☑	Quantitative assessment of bias	Sensitivity analyses indicate heterogeneity in strengths of the association due to most common biases in observational studies.
☑	Justification for exclusion	All studies were excluded based on the pre-defined inclusion criteria in methods section.
☑	Assessment of quality of included studies	Brief discussion included in ‘Methods’ section
Reporting of conclusions should include		
☑	Consideration of alternative explanations for observed results	Discussed in the context of the results.
☑	Generalization of the conclusions	Discussed in the context of the results.
☑	Guidelines for future research	We recommend analyses that would correct for regression dilution bias.
☑	Disclosure of funding source	No separate funding was necessary for the undertaking of this systematic review.